REMARKS / ARGUMENTS

A. Amendments to the Specification

The examiner has objected to the form of the specification in that the specification was single-spaced and difficult to read. Applicant has reformatted the specification to provide adequate spacing, line numbers and headings to improve readability. Applicant amended the specification to add a reference to a related application and to insert headings. A marked-up version of the specification showing only the text changes is attached hereto as Exhibit 1. No new matter was added to the specification.

The examiner further noted that the listing of references within the specification was not a proper information disclosure statement. A supplemental IDS has been filed contemporaneously with this amendment. Copies of patent references noted in the original IDS and not listed by the examiner have also been filed with the supplemental IDS. Additionally, copies of material incorporated by reference in the specification have also been provided. Applicant affirms that the attached copies are true copies of the incorporated material.

B. Claims Generally

Claims 30-38, 40, and 42-65 remain in this application. Claims 22-29 and 39 have been canceled. Claim 30 has been amended. Claims 42-65 have been added. The examiner objected to the form of the claims in that the claims were single space and difficult to read. Application has reformatted the claims to provide adequate spacing.

C. Rejections Under 35 U.S.C. § 112 (Second Paragraph)

Claims 22-40 were rejected under 35 U.S.C. §112, second paragraph as being indefinite. Applicant submits that with the cancellation of claim 22 and the rejections under 35 U.S.C. §112, second paragraph are moot.

D. Claim Rejections Under 35 U.S.C. §103(a)

Claims 22-29 and 39 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Twiney et al. (U.S. Patent 4,953,217) (herein, "Twiney") in view of Nagami et al. (U.S. Patent 5,404,409) (herein, "Nagami").

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA

1974). MPEP §2143.03, 8th Ed. (Rev. 2, 2004). Further, "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP §2143.01, 8th Ed. (Rev. 2, 2004).

> Claim 22 (as examined) of the present application recited the following limitations:
>
> In a personal active noise attenuating system having a head support structure, acoustic-electric transducer means thereon, a heteronomous electronic controller means with an algorithmic transfer function and a control actuator having a radius of reverberation, the improvement comprising
>
> an adaptive feedforward component portion of said controller which is adapted to attenuate tonal noises, and
>
> a feedback component portion of said controller which is adapted to attenuate broadband noises, whereby
>
> said portions are operable individually or in cooperation with one another to provide conventional broadband performance and adaptive narrowband noise suppression.

Claim 22 recited the limitation, "an adaptive feedforward component portion of the heteronomous electronic controller which is adapted to attenuate tonal noises." The examiner found that Twiney disclosed all of the limitations of claim 22 except the adaptive feedforward limitation. The examiner found that "it is old and well know in the ANC art to use both feedforward and feedback control means (heteronomous control) for improving the accuracy of producing noise cancel sound." (Office Action, Page 5.) Citing Nagami Figures 3 and 4, the examiner determined that Nagami disclosed an ANC system that uses switchable feedforward and feedback signal control configurations. Based on this analysis, the examiner concluded that it would have been obvious to combine Twiney and Nagami to produce the adaptive feedforward component limitation of claim 22 (as examined).

Referring to Figures 3 and 4 of Nagami, the terms "feedforward" and "feedback" control are used to identify two distinct controller components. Additionally, there is a switching means that switches between those two components of the controller in a binary (on-or-off) manner.

Applicant submits, however, that neither Nagami nor Twiney teach "an adaptive feedforward component portion of said controller which is adapted to attenuate tonal noises, and a feedback component portion of said controller which is adapted to attenuate broadband noises,

whereby said portions are operable individually or in cooperation with one another to provide conventional broadband performance and adaptive narrowband noise suppression." (Emphasis added by underlining.) The switch of Nagami does not perform the same function of the potentiometer (continuously variable) type of switch of Figure 12 of the present application. Nagami's switch is binary, it is either "on" or "off," and does not provide for linear combinations of the heteronomous feedback control signal and adaptive feedforward control signal. (See, Specification, Figure 4 and discussion of Figure 4 beginning at Col. 6, line 43 through Col. 7, line 66.) It is also noted that Nagami's feedback control is not a fixed gain feedback control as taught in the present application. Because the combination of Twiney and Nagami do not recite all of the limitations of claim 22, claim 22 is patentable over those references.

E. New Claims 42 -65

While Applicant believes that claim 22, if rewritten to overcome the objections of the examiner as to form, would be patentable over Twiney and Nagami, Applicant has chosen to cancel claim 22 and amend the Application to include new claims 42 – 65. Claim 42 recites the following limitations:

> 42. A heteronomous controller of a personal active noise attenuation system comprising:
>
> a feedback controller adapted for receiving an acoustically transduced signal from a noise error sensor and for generating a feedback active noise attenuating control signal portion;
>
> a processor adapted for:
>
> receiving an acoustically transduced signal from the noise error sensor;
>
> receiving a noise reference signal from a noise reference signal sensor, wherein the noise reference signal is correlated with the acoustically transduced signal from the noise error sensor and is controllable from the control speaker system to the noise reference signal sensor;
>
> applying an adaptive signal processing algorithm to the acoustically transduced signal from the noise error sensor and to the noise reference signal to generate an adaptive active noise attenuation control signal portion; and
>
> a linear combiner adapted for summing a linear combination of the feedback adaptive active noise attenuating control signal portion and the adaptive active noise attenuation control signal portion so as to generate a heteronomous control signal; and
>
> an electroacoustic control speaker system adapted for receiving and transducing

the heteronomous control signal to create a heteronomous acoustic control signal so as to attenuate broadband portions and further attenuate tonal portions of acoustic noise transduced at the noise error sensor.

Claim 42 recites the limitation, "a linear combiner adapted for summing a linear combination of the feedback active noise attenuating control signal portion and the adaptive active noise attenuation control signal portion so as to generate a heteronomous control signal." A previously discussed, neither Twiney nor Nagami teach or describe this limitation.

Claim 42 further recites the limitation, "receiving a noise reference signal from a noise reference signal sensor, wherein the noise reference signal is correlated with the acoustically transduced signal from the noise error sensor and is controllable from the control speaker system to the noise reference signal sensor." The examiner has cited Nagami as teaching a feedforward controller. However, Nagami does not discuss the need for a correlated reference signal as recited in claim 42. In addition, the reference signal of Nagami is sinusoidal in its design. Nagami does not teach that the reference signal will be correlated with the noise error signal because of multiple path problems. Thus, the controller of Nagami will not realize the goal of the heternomous invention described by claim 42. It is also important to note that claim 42 recites the limitation, "wherein the noise reference signal is correlated with the acoustically transduced signal from the noise error sensor." This element of the claimed invention describes a condition for the signal inputs to the adaptive controller portion. Twiney does not teach the use of adaptive signal processing in any way. For all of the foregoing reason, claim 42 is allowable over Twiney and Nagami.

Claims 43-65 depend, directly or indirectly, from claim 42. For the reasons discussed with reference to claim 42, claims 43-65 are allowable over Twiney and Nagami.

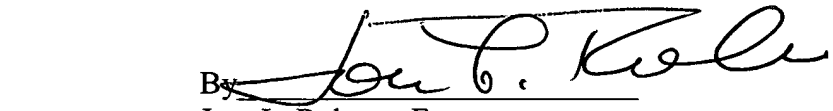
F. Claims 30-38 and 40

The examiner determined that claim 30, if rewritten as an independent claim incorporating all of the limitations of the base claim (claim 22) would be allowable over the cited prior art. Applicant has revised claim 30 by incorporating the elements of claim 22 corrected to overcome the examiner's rejections under 35 U.S.C. §112, second paragraph. Applicant submits that claims 30-38 and 40 as now written are allowable over the cited prior art.

G. Conclusion

In view of the above information and remarks, Applicant respectfully requests reconsideration of the current rejections. Applicant submits that based on the foregoing, claims 30-38, 40, and 42-65 are allowable over the cited prior art. Applicant further requests that a timely Notice of Allowance be issued in this case. Should any further questions arise concerning this application or in the event the above amendments do not place the application in condition for allowance, Applicant respectfully requests a telephone interview. Attorney for the Applicant may be reached at the number listed below.

Respectfully Submitted,

By 

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